AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

Claims 1-6 [Previously Cancelled]

7. [Previously Amended] A method as claimed in claim 32 wherein the step of encoding comprises steps of:

generating a plurality of scrambling patterns ; and

applying each scrambling pattern to a respective one data signal.

8. [Previously Amended] A method as claimed in claim 7 wherein the step of applying each scrambling pattern comprises steps of, at each transmitter:

aligning bits of the scrambling pattern with bits of the respective data signal with reference to a predefined starting point in the scrambling pattern; and

applying a reversible Boolean operation to the aligned bits, to generate the scrambled data signal.

9. [Previously Cancelled]

10. [Previously Amended] A method as claimed in claim 33 wherein the step of extracting comprises a step of removing segments from the pseudo-random bit sequence, each of the segments being used as a respective scrambling pattern.

11. [Previously Amended] A method as claimed in claim 32 further comprising a step of selecting a decoding scheme to apply to data received through each optical channel.

12. [Original] A method as claimed in claim 11 wherein the step of selecting comprises reading a hardware configuration setting in a decoder circuit of a receiver for the optical channel.

13. [Original] A method as claimed in claim 11 wherein the step of selecting comprises a step of reading a memory that stores a decoding scheme received in a message when the optical channel was commissioned.

14. [Original] A method as claimed in claim 11 wherein the step of selecting comprises a step of searching through a predefined set of decoding schemes adopted to decode data received on the optical channel.

15. [Original] A method as claimed in claim 14 wherein the step of performing a search procedure comprises at least one iteration of the steps:

selecting a decoding scheme;

applying the selected decoding scheme to at least a part of the data;

calculating a bit error rate for the decoded data; and

determining if the bit error rate is below a predetermined threshold.

Claims 16-25 [Previously cancelled]

26. [Previously Amended] The system as claimed in claim 34 further comprising a receiver that includes a descrambler that selects a decoding scheme to apply to data received on the optical channels.

27. [Previously Amended] The system as claimed in claim 26 wherein the descrambler comprises a decoder circuit having a hardware configuration setting that provides the decoding scheme to apply to data received.

28. [Previously Amended] The system as claimed in claim 26 wherein the descrambler comprises a memory that stores a decoding scheme received in a message when the optical channel was commissioned.

29. [Previously Amended] The system as claimed in claim 26 wherein the receiver comprises a memory that stores a predefined set of decoding schemes adapted to decode data received on the optical channel and the set of decoding schemes is searched to select the decoding scheme to apply to the data received.

30. [Previously Amended] The system as claimed in claim 29 wherein the descrambler searches the decoding schemes by applying a selected one of the decoding schemes to at least a part of the data; calculating a bit error rate for the decoded data; and determining whether the bit error rate is below a predetermined threshold.

31. [Previously Amended] The system as claimed in claim 26 wherein the descrambler aligns bits of a decoding pattern with bits of the data received with reference to a predefined starting point in the descrambling pattern, and applies a reversible Boolean operation to the aligned bits, to generate a decoded data signal.

32. [Previously Presented] A method of transmitting a wave division multiplexed (WDM) optical signal through an optical communications network, the method comprising steps of:

scrambling each one of a plurality of data signals using a respective unique scrambling pattern, each scrambling pattern being substantially de-correlated from the other scrambling patterns at any given offset; and

transmitting the scrambled data signals through respective channels of the WDM optical signal.

33. [Previously Amended] A method as claimed in claim 32, wherein the step of encoding each data signal comprises a step of:

extracting each of the scrambling patterns from a pseudo-random bit sequence.

34. [Previously Presented] A system for transmitting a wave division multiplexed (WDM) optical signal through an optical communications network, the system comprising:

a respective scrambler for scrambling each one of a plurality of data signals using a respective unique scrambling pattern, wherein each scrambling pattern is substantially de-correlated from the other scrambling patterns at any given offset; and

a transmitter for transmitting each scrambled data signal through a respective channel of the WDM optical signal.

35. [Previously Presented] A system as claimed in claim 34, wherein each scrambling pattern is extracted from a pseudo-random bit sequence.

36. [Currently Amended] A method of transmitting a WDM signal over an optical transmission system, comprising:

generating a respective pseudo-random pattern for each of a plurality of optical transmitters at a common transmit site, wherein each pseudo-random pattern is substantially de-correlated from the other pseudo-random patterns at any given offset;

at each optical transmitter, encoding a respective data signal using the respective pseudo-random pattern, and generating a corresponding encoded optical signal having a respective optical wavelength; and

optically multiplexing the encoded optical signals to generate a composite optical signal.

37. [Previously Presented] A method as defined in claim 36, further comprising:

transmitting the composite optical signal to a receive site of the optical transmission system;

optically demultiplexing the composite optical signal to separate at least one encoded optical; and

decoding the separated encoded optical signal.

38. [Previously Presented] A method as defined in claim 37, further comprising:

configuring hardware at the transmit site to determine the respective pseudo-random patterns used for encoding by each optical transmitter; and

configuring hardware at the receive site to determine a respective decoding scheme used for decoding each separated encoded optical signal.

39. [Previously Presented] A method as defined in claim 37, further comprising:

selecting a key determining a respective pseudo-random pattern for an optical transmitter at the common transmit site upon commissioning a connection using the optical transmitter between said transmit site and said receive site;

transmitting said key to said receive site upon commissioning said connection;

determining a respective decoding scheme for use at the receive site from said transmitted key.

40. [Previously Presented] A method as defined in claim 39, further comprising storing said key in memory at said receive site.

41. [Previously Presented] A method as defined in claim 37, further comprising performing a heuristic search through a set of pseudo-random patterns stored at the receive site while monitoring an error rate of a signal decoded using each of the stored pseudo-random patterns, and fixing the pseudo-random pattern used for decoding when the monitored error rate falls below a predetermined threshold.

42. [Previously Presented] A method as defined in claim 37, wherein the step of encoding comprises:

aligning data bits to be encoded with bits of the respective pseudo-random pattern; and

applying a reversible Boolean operation to the aligned bits to generate a respective encoded data signal.

43. [Currently Amended] A system for transmitting a WDM signal over an optical transmission system, comprising:

a pseudo-random pattern generator for generating a respective pseudo-random pattern for each one of a plurality of optical transmitters at a common transmit site, wherein each pseudo-random pattern is substantially de-correlated from the other pseudo-random patterns at any given offset;

a respective encoder associated with each optical transmitter, for encoding a respective data signal using the respective pseudo-random pattern, the optical transmitter generating a corresponding encoded optical signal; and

an optical multiplexer for optically multiplexing the encoded optical signals to generate a composite optical signal.

44. [Previously Presented] A system as defined in claim 43, further comprising:

an optical transmission medium for transmitting the composite optical signal to a receive site of the optical transmission system;

an optical demultiplexer for optically demultiplexing the received composite optical signal to separate at least one encoded optical signal; and

at least one decoder for decoding the separated encoded optical signal.

45. [Previously Presented] A system as defined in claim 44, further comprising;

hardware configured at the transmit site to determine the respective pseudo-random patterns used for encoding by each encoder; and

hardware configured at the receive site to determine a respective decoding scheme used for decoding each separated encoded optical signal.

46. [Previously Presented] A system as defined in claim 44, further comprising:

a key selector for selecting a key determining a respective pseudo-random pattern for an optical transmitter at the common transmit site upon commissioning a connection using the optical transmitter between said transmit site and said receive site and transmitting said key to said receive site upon commissioning said connection;

the decoder at the receive site being operable to determine a respective decoding scheme for use at the receive site from said transmitted key.

47. [Currently Amended] A system as defined in claim ~~11~~ 44, further comprising a memory for storing said key at said receive site.

48. [Previously Presented] A system as defined in claim 44, further comprising a channel monitor for performing a heuristic search through a set of pseudo-random patterns stored at the receive site while monitoring an error rate of a signal decoded using each of the stored pseudo-random patterns, and fixing the pseudo-random pattern used for decoding when the monitored error rate falls below a predetermined threshold.

49. [Previously Presented] A system as defined in claim 44, wherein the each encoder comprises:

a phase shifter for aligning data bits to be encoded with bits of the respective pseudo-random pattern; and

a logic unit for applying a reversible Boolean operation to the aligned bits to generate a respective encoded data signal.